Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) An apparatus for monitoring surface variations on a component, said apparatus comprising:

(a) a non-vibrating capacitance probe;

(b) means for positioning said non-vibrating capacitance probe in proximity to the component; and

(c) means for measuring the contact potential difference arising from relative motion between the component and said non-vibrating capacitance probe and changes in the contact potential difference being characteristic of correlated surface variations of the component.

2. (Currently amended) An apparatus according to claim 1, further comprising [[a]] means for measuring the relative motion between the component and said non-vibrating capacitance probe.

3. (Original) An apparatus according to claim 2, further comprising means for regulating the relative motion between the component and said non-vibrating capacitance probe.

4. (Original) An apparatus according to claim 1, further comprising means for measuring the spatial distance between the component and said non-vibrating capacitance probe.

5. (Currently amended) An apparatus according to claim 1, ~~further comprising a means for supporting the component~~ further including means for scanning which provides spatially continuous scanning of the probe relative to the component.

6. (Original) An apparatus according to claim 5, wherein said means for positioning said non-vibrating capacitance probe in proximity to the component is fixed relative to said means for supporting the component.

7. (Currently amended) An apparatus according to claim 1, wherein said surface variations [[is]] comprise surface wear.

8. (Currently amended) A process for monitoring surface variations on a component, comprising the following steps:

(a) imparting relative motion between the component and a non-vibrating capacitance probe;

(b) monitoring the relative motion between the component and the non-vibrating capacitance probe; and

(c) monitoring the contact potential difference between the component and the non-vibrating capacitance probe with changes in the contact potential difference characteristic of correlated surface variations of the component.

9. (Original) A process according to claim 8, further comprising the step of monitoring the distance between the said test surface and the non-vibrating capacitance probe.

10. (Original) A process according to claim 9, wherein the surface variation is surface wear.

11. (Currently amended) A non-contact detector for measuring a property of a sample comprising, a non-vibrating sensor being in electrical communication with a sample, the sample and the non-vibrating sensor having different work functions and being separated from one another by a characteristic distance, and a measurement device for measuring a current directly related to a temporal variation of a contact potential difference between the sample and the sensor, thereby measuring a property of the sample.

12. (Currently amended) The non-contact detector of claim 11, the sensor being a non-vibrating sensor which is structurally moved relative to the sample.

13. (Currently amended) A non-contact detector for measuring at least one of chemical properties and tribological wear of a component comprising:

(a) a non-vibrating sensor having a sensor work function, the non-vibrating sensor being in proximity to the component at a selected distance from the component and the non-vibrating sensor scanned relative to the component, and the component having a component work function; and

(b) a measurement device for measuring a temporal variation in a property relatable to the component work function and the temporal variations in a property selected from the group

of a correlated change in surface composition of the component, correlated change in the tribological wear of the component and correlated spatial variations of the component.

14. (Currently amended) The non-contact detector of [[C]]claim 13, the sensor work function being different than the component work function.

15. (Currently amended) The non-contact detector of [[C]]claim 14, the measurement device for measuring the temporal variation in the component work function wherein the property is determined by measuring an induced current which is related to a temporal change in contact potential difference between the component and the sensor.

16. (Currently amended) An apparatus for monitoring surface changes on a component, said apparatus comprising:

(a) a non-vibrating capacitance probe;

(b) a placement device for positioning the non-vibrating capacitance probe in proximity to the component and a system for scanning the probe relative to the component; and

(c) a first measurement device for measuring a property which is relatable to the contact potential difference between the component and the non-vibrating capacitance probe and the property relatable to the contact potential difference arising from at least one of a compositional surface change of the component, spatial variation and tribological wear.

17. (Previously presented) An apparatus according to claim 16, further comprising a second measurement device for measuring the relative motion between the component and the non-vibrating capacitance probe.

18. (Previously presented) An apparatus according to claim 17, further comprising a regulator capable of regulating the relative motion between the component and the non-vibrating capacitance probe.

19. (Previously presented) An apparatus according to claim 16, further comprising a third measurement device for measuring a nearest spatial distance between the component and the non-vibrating capacitance probe.

20. (Previously presented) An apparatus according to claim 16, further comprising a support for supporting the component.

21. (Previously presented) An apparatus according to claim 20, wherein the placement device for positioning the non-vibrating capacitance probe in proximity to the component is fixed relative to the support.

22. (Currently amended) A capacitance probe for measuring at least one property of a sample, comprising:

(a) a reference electrode and a sample forming at least part of an electrical circuit, the reference electrode disposed adjacent the sample and having a characteristic closest separation distance between the sample and the reference electrode, the reference electrode maintained substantially fixed during measurement of the at least one property, and the sample and the reference electrode forming a capacitor element of the electrical circuit;

(b) a voltage source coupled to the reference electrode and being part of the electrical circuit; and

(c) a device for measuring current induced by activating the voltage source in the electrical circuit, the measured current arising from a temporal change in the contact potential difference between the reference electrode and the sample with the temporal change associated with a change of at least one of a compositional change of the sample, tribological wear of the sample and a change of distance between the reference electrode and the sample.

23. (Currently amended) The capacitance probe of [[C]]claim 22, the reference electrode being a non-vibrating reference electrode.

24. (Previously presented) A non-contact detector for measuring at least one of tribological wear and chemical changes of a sample comprising, a non-vibrating sensor being in electrical communication with a sample, the sample and the sensor having different work functions and being separated from one another by a selected distance of closest approach and a measurement device for measuring a current related to a time varying change in the selected distance of closest approach between the sample and the sensor, thereby measuring the at least one of tribological wear and chemical changes of the sample.

25. (Currently amended) The non-contact detector of [[C]]claim 24 wherein the tribological wear comprises mechanical defect surface variations of the sample.

26. (Currently amended) A method of sensing at least one of chemical properties and tribological wear of a sample comprising the steps of:

[[(a)]] positioning a non-vibrating sensor in proximity to the sample, the sensor being separated by a selected distance from the sample~~; and~~

scanning the non-vibrating sensor relative to the sample; and

[[(b)]] measuring a current related to a contact potential difference between the sample and the sensor and analyzing the current to determine at least one of the chemical properties and tribological wear of the sample.

27. (Cancel) The method according to Claim 26, further comprising step (c) of imparting relative motion between the sample and the sensor.

28. (Currently amended) A method of sensing at least one of chemical properties and tribological wear of a sample comprising the steps of:

[[(a)]] locating a non-vibrating sensor having a sensor work function in proximity to the sample having a sample work function, the sensor being separated by a selected distance from the sample;

scanning the non-vibrating sensor relative to the sample;

[[(b)]] measuring an induced current between the sample and the sensor; and

[[(c)]] determining at least one of chemical properties and tribological wear of the sample by relating the induced current to at least one of (i) a difference between the sensor work function and the sample work function and (ii) a variation in the selected distance from the sample.

29. (New) A system for measuring a changing contact potential difference characteristic of variations of a material at the surface of a component, comprising:

a sensor having a sensor work function, the sensor disposed in proximity to the component at a selected distance from the component, and the component having a component work function;

a mechanism to drive at least one of the component and the sensor laterally relative to one another; and

a measurement device for measuring a temporal variation in contact potential difference between the sensor and the component over a spatial range along the component, the temporal variation of contact potential difference arising from the sensor moving laterally relative to the component and experiencing surface variations over the spatial range of the material with the contact potential difference characteristic of properties of the surface of the component.

30. (New) A non-contact detector for determining differences of contact potential difference at locations along the surface of a component having a component work function, comprising:

(a) a non-vibrating sensor having a sensor work function and when the non-vibrating sensor is disposed in proximity to and scanned relative to the component, a surface charge is detected as a result of the temporal change of the work function of the component; and

(b) a measurement system which uses the surface charge sensed by the non-vibrating sensor to determine a contact potential difference for the component as the sensor is scanned relative to the surface of the component, the contact potential difference changes being characteristic of changes of composition of the material at the surface of the component along a spatial line of the component.

31. (New) The non-contact detector as defined in claim 30 wherein the changes in the contact potential difference comprise microstructural variation of the component surface.

32. (New) The non-contact detector as defined in claim 31 wherein the measurement system provides a quantitative analysis result for the surface of the component.

33. (New) A non-contact detector for performing analysis of the surface of a component, comprising:

a sensor having a sensor work function and the sensor when disposed in proximity to the component and scanned relative to the component senses a temporal change of the work function when passing from one material area to another material area of the component along a spatial dimension of the component; and

a system for analyzing the temporal change of the work function to characterize at least one of composition and quantitative measure of dimensional changes at the surface of the component along the spatial dimension of the component.

34. (New) A method of determining differences of contact potential difference for a component and relating the difference to component properties, comprising the steps of:

positioning a sensor near a component surface, the sensor having a sensor work function and the component a component work function;

scanning the sensor laterally relative to the component along a component line, the scanning step generating a surface charge when a temporal change of the work function occurs along the component line; and

measuring the surface charge over the component line and characterizing at least one of composition and wear of the surface of the component over the component line.

35. (New) A method for monitoring surface variations on a component, comprising the steps of:

positioning a non-vibrating capacitance probe near a component being monitored;

scanning the non-vibrating capacitance probe relative to the component; and

measuring along a line the contact potential difference between the component and said non-vibrating capacitance probe, with measured changes at points along the line of the contact potential difference being characteristic of correlated surface variations of the component.

36. (New) A method according to claim 35, wherein the scanning step provides spatially continuous scanning of the probe relative to the component, thereby allowing mapping of the surface variations of the component.

37. (New) A process for monitoring surface variations on a component using a capacitance probe, comprising the following steps:

(a) determining a contact potential difference for a component by imparting relative lateral motion between the component and the capacitance probe;

(b) monitoring the relative lateral motion between the component and the capacitance probe to identify location along the component; and

(c) monitoring the contact potential difference between the component and the capacitance probe with changes in the contact potential difference characteristic of surface variations of the component which are then correlated to the location on the component.

38. (New) The method as defined in claim 37 wherein the relative lateral motion maps a line of points on the component characteristic of the correlated surface variations of the component.